

## A STRUCTURE PACKAGE

### Abstract

5 Wireless devices use protruding antennas for transmitting and receiving data signals. These protruding antennas govern the size and dimensions of these wireless devices. Perpetual reduction in the size of these wireless devices has resulted in an increasing need and desire to eliminate the protruding antennas. Solutions such as reducing the protruding antenna to a stub or using retractable antennas have limitations. The  
10 antenna stub sacrifices performance for size reduction. Additionally, the retractable antennas are usually physically separated from the integrated circuit. Electrical connectors interconnecting the external antenna and the integrated circuit can mechanically fail due to connector flexure. An improved integrated structure package is described according to embodiments of the invention where a plurality of pillar  
15 structures is used for inter-coupling and spatially displacing one or more semiconductor chips from a substrate to realise a stacked antenna configuration for space and footprint reduction. The good structural integrity of the plurality of pillars also provides mechanically robust electrical interconnections between circuits and antenna patterns formed on the substrate or in the semiconductor chip. The plurality  
20 of pillars can be further arranged for providing faraday shielding to an integrated circuit from electromagnetic interference. Dielectric material is further introduced between pairs of the plurality of pillars for forming capacitors for reducing parasitic capacitance.

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Figure 1